

SECTIONAL ADJUSTABLE SOCKET TOOL HANDLE

FIELD OF THE INVENTION

The present invention relates to a sectional socket tool handle, and more particularly to a socket wrench that controls
5 an axial rod and an external pipe by a coupler.

BACKGROUND OF THE INVENTION

Wrenches make our life much easier, people can use different wrenches for different working environments according to their needs. There are all kinds of conventional
10 wrenches such as hexagonal wrenches, open wrenches, mobile wrenches, and socket wrenches, etc.

Socket wrenches are divided into fixed socket wrenches and adjustable socket wrenches. The design and application of a socket wrench are described as follows:

15 1. A fixed socket wrench as disclosed in the R.O.C. Patent No. 450181 entitled "Contractible positioning structure of powerful wrench socket" comprises a wrench body, a rotary section disposed at an end of the wrench body, a rotary coupler with a rectangular cross section connected to the rotary section
20 for connecting sockets of different sizes. When a force is applied to rotate the wrench body, the wrench rotates back and forth in order to save power. However, the wrench body of the prior art has a fixed length, which limits the application of a long-distance force when needed.

25 2. A contractible wrench as disclosed in the R.O.C. Patent

No. 122740 entitled "Improved adjustable handle structure of adjustable socket wrench" comprises a socket wrench body in the shape of a rod and a handle in the shape of a pipe. The wrench body is disposed inside the handle and capable of moving along the axial direction of the handle for adjusting the length of the wrench as needed. However, the conventional adjustable socket wrench not only clamps the fingers easily when the length is adjusted, but is also easy to slip when a force is applied to the wrench.

10 In view of the shortcomings of the aforementioned prior art, a tool wrench according to this invention is disclosed.

SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a safe and reliable sectional adjustable socket wrench handle.

15 The sectional adjustable socket tool handle comprises: an axial rod and an external pipe, wherein the axial rod being disposed in the external pipe and capable of moving along the axial direction of the external pipe, and a plurality of grooves being disposed around the axial rod for latching on the external pipe. A coupler is designed at one end of the
20 external pipe, which moves between a first position and a second position along the axial direction of the external pipe for engaging a plurality of grooves and controlling the operation of the axial rod and the external pipe.

25 Another objective of the present invention is to adjust the

contractible distance of the axial rod and the external pipe according to the user's need to provide an appropriate torque.

A further objective of the present invention is to provide an easy-to-operate sectional adjustable socket tool handle, wherein the coupler for controlling the axial rod and the external pipe can effectively prevent the user's fingers from being clamped, or the wrench from having a slippery engagement.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view of the disassembled parts of the sectional adjustable socket tool handle of this invention.

FIG. 2 is a cross-sectional view of the sectional adjustable socket tool handle of this invention.

FIGS. 3A and 3B are views showing the movements of sectional adjustable socket tool handle of this invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The detailed description and technical characteristics of the present invention are described with the drawings as follows.

Please refer to FIG. 1 for the sectional adjustable socket tool handle, which comprises: an axial rod 1, having a bent section 11; a connecting section 10 extended from one end of the bent section 11 and using the bent section 11 as a boundary, and the connecting section 10 being a cylinder with a rectangular cross section; a latch member 101 disposed on the

connecting section 10 for connecting a socket (not shown in the figure), a blocking section 12 and a main body section 13 being coupled to the other end; and an external pipe 2 having a plurality of apertures 20 and a plurality of latch members 21, such that when the axial rod 1 being disposed inside the external pipe 2 in an open state or a close state, the uppermost edge of the external pipe 2 pressing against the blocking section 12.

Please refer to FIGS. 1 and 2 for the movement of the axial rod 1 inside the external pipe 2 controlled by a connecting means which comprises: a through hole 14 passing through the lower edge of the axial rod 1, a resilient member 15 being a spring disposed inside the through hole 14; two latches 16 each being a ball bearing disposed on both sides of the resilient member 15; a second circular groove 23 (substantially disposed on another end of the aperture 20) being disposed on an inner wall of the external pipe 2. When the axial rod 1 moves along the axial direction of the external pipe 2 and extends outward to a maximum distance, the latch member 16 is pushed towards the second circular groove 23 by the tension of the resilient member 15 to press against the second circular groove 23, so that the axial rod 1 and the external pipe 2 will not be separated from each other. A base 17 is disposed at the bottom of the axial rod 1 for securing the axial rod 1 and preventing it from swinging or shaking when the axial rod 1

and the external pipe 2 move along the axial direction.

A plurality of grooves 131 are disposed equidistant from each other around a main body section 13 of the axial rod 1; a plurality of apertures 20 are disposed around the top of the external pipe 2; and a plurality of latch members 21 is disposed at the plurality of apertures 20 respectively, such that when the axial rod 1 moves along the axial direction of the external pipe 2 to latch a groove 131 and adjust the contractible distance of the axial rod 1 and the external pipe 2 as needed.

A coupler 3 is a movable hollow pipe installed at the top of the external pipe 2 and surrounding the foregoing plurality of apertures 20 and having a resilient member 31 disposed inside the coupler 3. The resilient member 31 is a spring with one end being fixed into a first circular groove 22 of the external pipe 2 by a fixture 30, which is a latch ring, and the other end pressing against the latch section 32 inside the coupler 3. The coupler 3 has a compressing section 33 and a releasing section 35. When the foregoing latch member 21 latches the groove 131 under normal conditions, the coupler 3 can move along the axial direction of the external pipe 2 between a first position and a second position as shown in FIG. 2. The compressing section 33 presses against the latch member 21 for restricting the movement of the axial rod 1. When a coupler 3 moves to the second position as shown in FIG. 3A, the releasing section 35 releases the latch member 21, and thus

the axial rod 1 can move freely. Further, the compressing section 33 and the releasing section 35 individually have an aslant surface 34 for facilitating the latch member 21 to slide between the compressing section 33 and the releasing section 35 while the coupler 3 is moving.

Please refer to FIGS. 3A and 3B again. Under normal conditions, the coupler 3 moves along the axial direction of the external pipe 2 between the first position and the second position. When the coupler 3 moves to the second position as shown in FIG. 3A, the releasing section 35 will release the latch member 21, and latch member 21 remains being latched with the groove 131 at that time. Under abnormal conditions, the axial rod 1 can freely move along the axial direction of the external pipe 2 as shown in FIG. 3B, since the latch member 21 is positioned at the releasing section 35.

While the invention has been described by way of example and in terms of a preferred embodiment, it is to be understood that the invention is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.